

# FEDERAL TAX LAWS AND CORPORATE DIVIDEND BEHAVIOR\*

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*The author considers the corporate dividend-savings decision by means of a statistical model applied to data gathered over a forty year period. Stressing the impact of federal tax laws since World War I, he finds that cash flow provides a better explanation of dividend behavior than profits after depreciation, as reported for tax purposes. Individual tax rates, interest rates, investment demand and corporate liquidity are also found to affect the level of dividends. The author then analyzes the policy implications of these findings.*

In 1966, American corporations earned some \$48 billion after taxes. About \$21 billion of this aggregate sum was distributed as dividends; the remainder was saved for future investment. Decisions about retaining and distributing corporate earnings significantly affect not only the current income of stockholders, but also the value of corporate securities, total investment and the nation's economic growth and stability. The objective here is to isolate some of the major determinants of the corporate dividend decision and to indicate relationships between dividend payout and federal government policy, particularly the tax laws.

The investigation underlying the results to be summarized was carried out by means of detailed statistical models.<sup>1</sup> An attempt will be made to give the gist of the research method and a sample of the statistical results without burdensome detail. It is hoped that these brief references to the statistical analysis will help permit evaluation of the findings without undermining the continuity of this presentation.

Various factors in dividend policy have been considered, but primary attention will be given to the influence of federal tax laws. The two main factors stressed here are (a) laws and provisions liberalizing allowable depreciation (which distort the measurement of corporate income), and (b) individual income tax rates.

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\* This article is an elaborated version of Corporate Earnings, Corporate Dividends, and Public Policy, Brookings Research Report 50 (1966).

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<sup>1</sup> See generally J. Brittain, Corporate Dividend Policy (1966), for details of the author's study.

## I. THE EFFECT OF INCOME ON DIVIDENDS

Corporate income after taxes is the foundation upon which the level of dividends rests. It ultimately determines corporate ability to pay dividends and to retain earnings for investment. It has often been assumed that the relationship of dividends to net earnings, in the aggregate and over time, has been relatively constant. However, data for the forty-year period from 1920 to 1960 indicate that the ratio of dividends to net profits has, in fact, varied widely. Table I demonstrates the extent of this variation. It shows aggregate and manufacturing dividends, net profits, and dividend payout percentages for 1920 and 1960, and for two intermediate years with very high and very low payouts ratios.

TABLE I  
DIVIDENDS AND PROFITS AFTER TAXES, AND PAYOUT  
PERCENTAGES, SELECTED YEARS

(Dollar amounts in billions)

Year	All Corporations			Manufacturing Corporations		
	Dividends	Net Profits*	Payout Percentage	Dividends	Net Profits*	Payout Percentage
1920	\$2.98	\$4.65	64.1	\$1.46	\$2.65	55.1
1929	5.72	8.03	71.2	2.65	4.23	62.6
1947	6.24	17.55	35.6	3.41	10.06	33.9
1960	13.05	21.11	61.8	6.67	11.46	58.2

\* After federal and state income tax accruals, but before 1965 data revisions.

There have been three distinct trends in the payout ratio. During the 1920's, the payout percentage drifted upward from 64 to 71 percent; between 1929 and 1947, it fell to 36 percent; after World War II, it almost regained the 1920 level, standing at 62 percent in 1960.

It is apparent that factors aside from net profits must have influenced the level of dividends during this period. These factors would account for the differences in dividends paid out at any given level of net profits. Two explanations of this variability are possible. First, corporations may use some measure of income other than net profits as an indication of their ability to pay dividends. Second, whatever the payout base, other factors in the corporate environment may induce changes in the allocation of net profits between dividends and corporate saving.

Do net profits, as reported in official government sources, accurately reflect corporate assessments of income, or is some other measure more closely related to dividend decisions?

The most apparent source of possible divergence between corporate and official evaluations of after-tax profits lies in the measurement of depreciation. The amount of depreciation allowable for tax-return pur-

poses was considerably increased during World War II and in the post-war period. As a result, corporations may regard net profits after official depreciation as an understatement of their earnings.

This explanation is supported by a comparison of growth rates, shown in Chart I. With an increasing proportion of gross income charged as depreciation, net profits reported on tax returns have grown at a slow rate since World War II. As Chart I indicates, growth of dividends was much more nearly parallel to growth of cash flow—profits net of taxes but before depreciation—than to net profits.

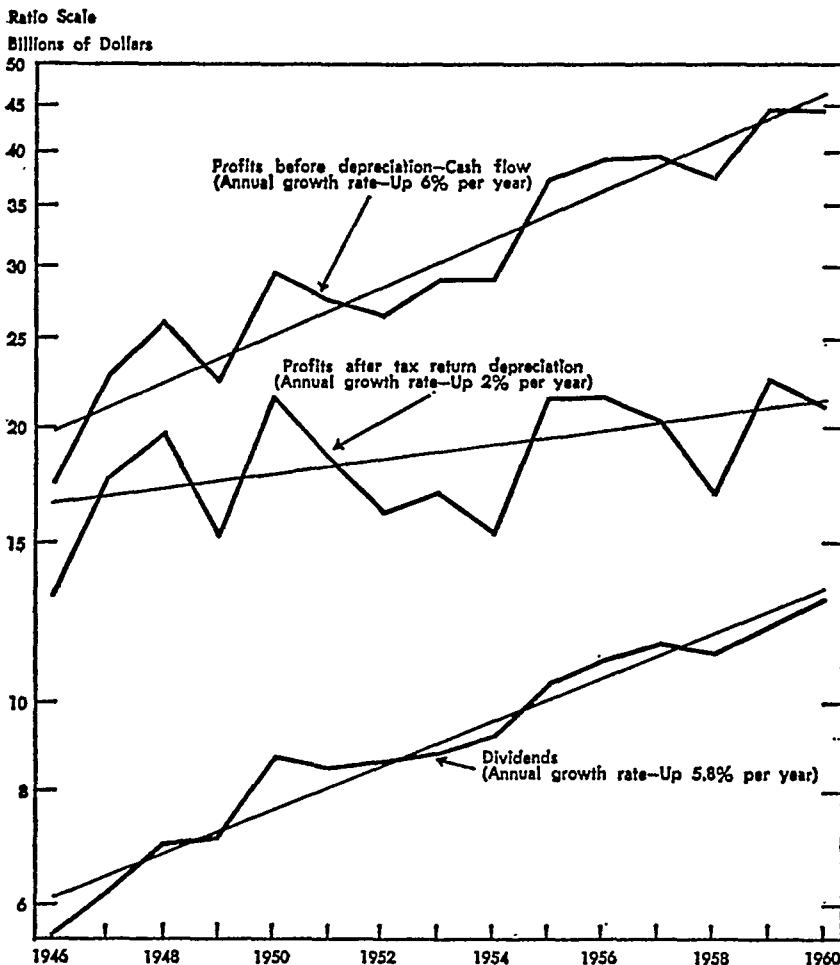


CHART I  
POSTWAR CORPORATE DIVIDENDS AND AFTER-TAX CORPORATE  
INCOME MEASURES, 1946-60

Several alternative approaches were used in the search for a more accurate measure of the corporate evaluation of the ability to pay dividends since the beginning of World War II. One approach was to allow the payout ratio as determined from official net profits to vary with an explicit measure of the impact of changing depreciation allowances. Several measures were devised for the purpose. One was based on estimated actual, as opposed to reported, depreciation; another used a measure of excess depreciation—the difference between reported and estimated actual depreciation; a third was a depreciation liberality index—the ratio of reported depreciation to estimated actual depreciation.

A second approach was to substitute cash flow for net profits as the income base of the dividend payout ratio. Since cash flow measures after-tax income before depreciation is charged against it, definitional differences in depreciation cannot distort the payout ratio.

The evaluation of the alternative approaches and income measures was carried out by a generalization of a dividend model proposed by Lintner.<sup>2</sup> The relationship was devised as a description of the behavior of individual firms, but it can also be used to explain changes in aggregate dividends. We start with the following definitions:

- $D$  = Net cash dividends in current year
- $D_{-1}$  = Net cash dividends in previous year
- $Y$  = Various measures of corporate income
- $P$  = Profits after taxes and depreciation
- $A$  = Depreciation charges
- $C = P + A$  = Cash flow
- $r$  = Target or long-run dividend-income ratio

In its simplest form the estimated annual change in aggregate dividends is described as follows:

$$(1) \quad D - D_{-1} = a + c(rY - D_{-1})$$

Corporations are pictured as pursuing a "target" payout ratio  $r$  which they apply to current income  $Y$ . If dividends were fully adjusted each year to achieve the target level  $rY$ , they would be changed by  $(rY - D_{-1})$  between the current and previous year. However, a conservative bias against large revisions leads them to move only a fraction of the way, given by a speed-of-adjustment coefficient  $c$ . The constant term  $a$ —expected to be positive—was added to allow for a presumed greater reluctance to cut dividends than to raise them. If  $a$  is positive, the model says that aggregate dividends will tend to drift up even if the rest of the model calls for no change.

<sup>2</sup> See Lintner, "Distribution of Incomes of Corporations, among Dividends, Retained Earnings and Taxes," 46 Am. Econ. Rev., Papers and Proceedings 97-113 (1956).

In Lintner's study net profits  $P$  was used as the measure of corporate income  $Y$ . However when this variable is used in equation (1) fitted to annual data for 1942-60 only 61 percent of the annual variation is explained, and the estimated target payout ratio  $r$  emerges as an implausible 90 percent—far above any observed  $D/P$  ratio in that period. The model appears to have been strained by the demand that it explain the rapid rise in dividends on the basis of the sluggish profits series shown in Chart I.

When the cash flow variable was substituted for net profits the fraction of dividend variation explained improved significantly to 78 percent, and the estimated target payout ratio applied to cash flow was 29 percent, which was typical of the very stable  $D/C$  ratios during 1942-60. The fitted equation was:

$$(2) \quad D - D_{-1} = .28 + .54 (.29C - D_{-1})$$

According to this description corporations in the aggregate aimed at paying out 29 percent of cash flow in dividends, but in any given year they adjust dividends toward the target level by only 54 percent of the existing gap.<sup>3</sup>

Explicit inclusion in the equation of additional variables which allowed for liberalized depreciation also improved in all cases the explanation of dividend variation offered by the net profit variable. However, cash flow provided the best explanation. The payout ratio based on cash flow is, of course, proportionately smaller than a ratio based on net profits, but the relationship of changes in dividends to those in cash flow appeared to be closer. This does not necessarily imply that every firm bases its dividend policies on its own cash flow. However, it does suggest that changes in cash flow reflect fairly accurately changes in the income measures that are used by individual firms.

Although the superior explanatory performance of cash flow can be given no definite behavioral interpretation, a few additional observations are in order. First, a short-run determination of dividends by cash flow (as a liquidity variable) is undoubtedly more plausible than cash flow as a long-run determinant. In the long run, "true" economic depreciation will generally be interpreted by firms as a charge against the flow from which dividends are paid. Thus the conclusion here that the cash flow measure provides the best statistical explanation of dividends in the 1942-60 period carries no implication that corporate officials either ignore economic depreciation or reject the economist's view that it constitutes a cost. They may only regard depreciation reported for

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<sup>3</sup> Also an upward drift of total dividends of about \$280 million per year is expected even when the current target level equals last year's dividends.

tax purposes as a poor measure of that cost. If so, there are two reasons to expect their dividend payments to be linked statistically to cash flow. In the first place, some firms may wish to pay out a certain fraction of "true" net profits, but they have no reliable measure of depreciation; as a substitute they pay out a (smaller) fraction of cash flow on the ground that a relative change in this indicator is the best available estimate of the relative change of "true" net profits. Secondly, other firms may substitute alternative depreciation estimates for tax depreciation and base dividends on adjusted net profits; however, insofar as their depreciation estimates remain a stable fraction of cash flow, dividends will still follow the latter closely. Both types of dividend policy recognize depreciation, but neither accepts officially measured net profits as the payout base. It may be concluded tentatively that the superior explanation of dividends by cash flow, as compared to official net profits, reflects these two behavioral patterns, as well as the direct impact of cash flow on dividends in the short run.

Summing up, it is apparent that liberalized tax provisions concerning depreciation have artificially depressed the growth rate of measured net profits. The superior explanatory performance of cash flow offers further evidence that this misleading accounting phenomenon may be the primary explanation of the postwar rise in the payout ratio based on net profits. However, it should also be added that the liberalization of depreciation allowances had a direct and real effect on the *level* of dividends as well as the dividend payout ratio. Higher depreciation allowances reduce taxes; hence, they increase the net income base (however measured) from which dividends are paid. This is also true of decreases in corporate tax rates. While these changes in effective tax rates do not appear to alter the dividend payout ratio, they do affect the ability of corporations to pay dividends and retain earnings. Since the payout ratio affects aggregate saving, these relationships need to be considered by policymakers concerned with depreciation provisions and corporate taxation generally.

## II. CHANGES IN THE PROPENSITY TO PAY DIVIDENDS

The size of the corporate income base, even when corrected for changing depreciation practices, does not fully account for variations in dividend behavior over the whole 1920-60 period. This was to be expected since dividends averaged about 45 percent of cash flow in the late twenties compared to only about 30 percent in the 1942-60 period. Explanations based on corporate income alone tend to understate actual changes in dividends in the period preceding World War II and overstate them during the later period. Apparently, structural changes

unrelated to the ability to pay dividends affected the level of dividends during this period.

One important change in the economic environment that might have produced such a pattern was in the effective rate of individual taxation. As effective and statutory tax rates on individual incomes increase, the net income realized by stockholders from any given dividend payment diminishes. Insofar as the retention of corporate earnings leads to an increase in capital gains, the relatively low rate of taxation on capital gains makes corporate saving an attractive "tax shelter" for stockholders. The evidence suggests that corporate officials respond to an increase in individual taxes by depressing the dividend payout ratio and increasing corporate saving.

There were large increases in individual income tax rates between the twenties and the wartime and postwar periods, and the tax-shelter effect seems to explain the decline of the payout ratio during these years. While depreciation and corporate tax rates remained important determinants of the level of net profits, individual tax rates were important in determining the fraction of this flow paid out in dividends.

Several other factors, along with individual tax rates, appeared to influence the long-run payout ratio. The most consistently important of these was interest rates. Increases in interest rates appeared to encourage greater retention of corporate earnings. Evidently corporate management attempts to avoid the higher cost of external financing by retaining a larger share of profits for investment.

The influence of individual tax rates ( $t$ ) and interest rates ( $i$ ) was established statistically by a generalization of equations (1) and (2). Instead of assuming the target payout ratio ( $r$ ) to be fixed, it was assumed to vary with tax rates and interest rates.<sup>4</sup> For example, the fixed target ratio in equation (2) was replaced by a relationship allowing  $r$  to depend on  $t$  and  $i$  as shown within the parentheses in the following relationship estimated for the years 1920-60.<sup>5</sup>

$$(3) \quad D - D_{-1} = .21 + .37 [ (.76 - .56t - .34i)C - D_{-1} ]$$

Here the estimated payout ratio applied to aggregate cash flow is seen to vary inversely with tax rates and interest rates.<sup>6</sup> This supports the hypothesis that the desire to avoid high tax rates since the beginning of World War II brought about relatively low dividend payments. The

<sup>4</sup> Various time series measures or indexes of these complex factors were employed in the study, but their influence appeared consistently for each measure tested.

<sup>5</sup> The years 1936-38 were excluded from the analysis due to the special effects of the undistributed profits tax at that time.

<sup>6</sup> The coefficients of these variables are significantly negative according to standard statistical tests.

result shown for interest rates also supports the conjecture that firms seek to avoid high finance costs by stepping up internal financing.

About 85 percent of the variation of year-to-year changes in dividends was explained by the variables on the right hand side of equation (3). The mechanism by which the three significant public policy instruments—depreciation, individual tax rates, and interest rates—operates to influence aggregate dividends may be restated in terms of this particular equation. Depreciation does not appear as a separate variable in this model, but its effect is implicit in the use of cash flow to measure corporate income. The equation provides explicit estimates of the unintended influence of the other two policy instruments on dividend policy. For example, an increase of 10 percentage points in the tax rate measure would tend to depress the target payout ratio by 5.6 percentage points; similarly, a 1 percentage point increase in interest rates would tend to cut the target ratio by 3.4 percentage points.

The target ratio, applied to corporate cash flow, determines the target level of dividends for any given year; the change in dividends required to hit this target is the difference between the previous year's dividends and the current target level. However, the expected change differs from this for two reasons. First, only a partial adjustment of the dividend level is made within a one-year span; according to this model, only about 38 percent of the indicated annual change is carried out each year. Second, the total predicted annual change in dividends is about \$210 million greater than indicated by this partial closing of the gap between last year's level and the current target. This is presumed to be due to a ratchet effect, or downward resistance to dividend cuts on the part of hard-pressed firms.

Several other possible factors in dividend policy were also considered. A rapid rate of corporate growth seemed to encourage corporate saving, although its influence on the payout ratio, while significant, was much less than that of tax rates. The negative relationship of growth to dividend payout may arise from an inclination to retain a larger percentage of earnings to support further investment, or because the rapid growth rate may be viewed as temporary.

Investment demand and corporate liquidity also were ultimately found to have an important, although less consistent, influence on dividends. Investment demand, measured by the ratio of plant and equipment expenditures to income originating in corporations, was negatively related to dividend payout; while corporate liquidity, measured by the ratio of liquid assets to net assets or to sales, had a positive influence.

Within the theoretical and empirical framework outlined above, the primary determinant of dividends continues to be corporate income.



However, the effect of depreciation and corporate taxes on after-tax income, and the influence of individual tax rates and interest rates on the percentage of income paid out, indicates that dividends can be sharply modified by instruments of public policy.

#### A. *Results for Industries and Firms*

Models similar to those used to isolate the determinants of aggregate dividend behavior were also applied to data for industries and firms. The initial tests were based on time series data for seventeen industries, which together approximate the corporate aggregate, and for a sample of forty large individual corporations. No attempt was made to have the firm sample representative of the corporate aggregate. The results of these time series tests were mixed. The industry analysis strongly supported the depreciation, tax-shelter, and interest-rate hypotheses. Time series tests for firms were less convincing, however. The above hypotheses were each supported by only one-third to one-half of the forty firms, but the models were especially successful when applied to some very large firms.

An alternative statistical technique was also applied to the data for the firm sample. While the time series analysis dealt with the dividend behavior of each firm over time, the alternative technique involved estimating by cross-section analysis the long-run payout ratio representing the collective dividend behavior of the forty firms during each year. These cross-section estimates, based on interfirm differences, were used to isolate the role of various factors in variations in dividends over time. The results of this technique indicated strong response to the three public factors—interest rates, depreciation, and individual tax rates. Moreover, they indicated that corporate liquidity and investment demand were also significant determinants of dividend payout ratio.

The estimated "contribution" of these five variables to the explanation of the 1920-60 variation in the target ratio of dividends to net profits is sketched in Chart II. The contribution of each factor is measured as a percentage point deviation from the mean. When each variable is at its mean level, the model estimates the target payout ratio as 68 percent. The effect on the payout ratio of a variable's departure from its mean level may be estimated from the individual charts. For example, when the depreciation liberality index was low in 1947 the model says this depressed the target payout ratio 10 percentage points below what it would have been if depreciation liberality had been at its average level. Similarly, the above-average liberality of depreciation in 1960 made for a payout ratio 7 percentage points higher than it would have been under the average level of depreciation. The second chart shows clearly the degree to which high tax rates in the 1942-60

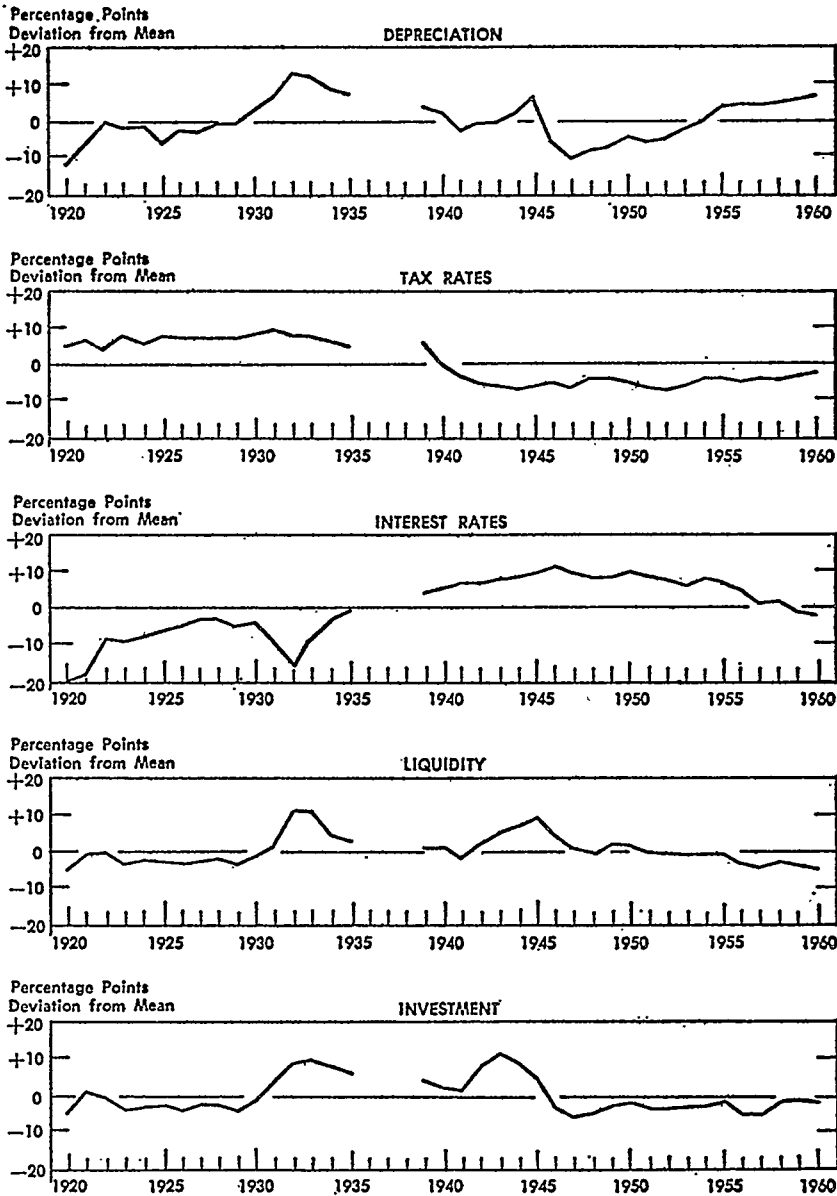


CHART II  
CONTRIBUTIONS OF FIVE VARIABLES TO EXPLANATION OF  
ESTIMATED LONG-RUN TARGET PAYOUT RATIOS, 1920-60

period depressed payout relative to the twenties, and the other charts can be similarly interpreted.

### B. *Implications for Related Problems*

The factors that determine dividend behavior will also affect corporate saving behavior. The influence of the dividend determinants is of two types. The determinants that change the size of corporate net income without changing the payout ratio will affect both corporate saving and dividends in a similar direction. An increase in corporate taxes, for instance, will reduce both savings and dividends by amounts proportionate to their original shares in net earnings. The determinants that alter the payout ratio, however, produce opposite changes in savings and dividends at any given level of net income. For example, an increase in interest rates would depress the dividend payout ratio and cause a rise in the level of corporate saving. The increase in individual income tax rates over the 1929-47 period was a major factor in reducing the dividend payout ratio. By implication, then, corporate saving was greater in 1947 than it would have been under 1929 tax rates.

The effect of liberalized depreciation on corporate saving is somewhat more complex. The ratio of officially measured corporate saving to net profits decreased in the 1947-60 period, for example, because rising depreciation allowances reduced measured net saving proportionally more than net profits. This effect was an accounting phenomenon rather than an economic one, however, and does not represent a decrease in the level of saving on a consistently measured basis. Insofar as liberalized depreciation results in a lower effective corporate tax rate, corporate net income is increased, permitting higher levels of both saving and dividends.

The distribution of individual incomes is also affected by changes in dividend levels since higher income groups receive a major portion of all dividends paid out. Thus, the corporate income tax (by reducing the payout base) and the individual tax on ordinary income (by providing a tax-shelter motive for a lower payout percentage) both act to reduce the relative income share of higher-income groups.

Because of increased retention, the effect of a reduction in dividends on individual incomes is at least moderated and perhaps even more than offset, however, by the lower rate of taxation on capital gains. The reduction in dividends is accompanied by an increase in retained earnings that presumably leads eventually to capital gains, the major portion of which escapes the income distribution statistics altogether.

This study also furnishes some evidence that official measures of profits, net of tax-return depreciation allowances, may be misleading

indicators for corporate decision-making. In fact, it is probable that the apparent "profit squeeze" widely discussed during the first fifteen post-war years was largely the result of charging an increasing proportion of gross profits off to depreciation. The relationship of dividends to cash flow or to any of several net profit measures based on less liberal definitions of depreciation was closer than to that based on tax return net profits. This would indicate that, in this area of corporate policy at least, net income is defined differently for purposes of taxation than it is for corporate decision-making.

### C. *Policy Implications*

Some elements of federal fiscal policy have substantial influence on corporate dividend-saving decisions. While a change in the level of corporate saving may be a direct aim of public policy, corporate saving may also be affected indirectly by the use of fiscal instruments to attain other economic ends. These side effects may or may not be compatible with the principal policy objective.

As a direct policy objective, a change in the corporate dividend-saving relationship raises several issues. Advocates of a high level of corporate saving have recommended an increase in retained earnings to stimulate investment and economic growth or to reduce inflationary pressures by decreasing the rate of total spending, and to promote income equality by displacing dividend payments, the bulk of which would accrue to high income groups. On the other hand, proponents of a higher dividend level cite the value of increasing total spending during recession and of promoting business competition by reducing the concentration of corporate saving and forcing greater reliance on the capital market for investment funds.

Regardless of public policy toward corporate saving, however, the level of retained earnings may be inadvertently changed by shifts in tax and interest rate policy aimed at other objectives. If these effects on corporate saving should be inconsistent with the primary objectives, then direct measures designed to influence the corporate dividend-saving decision might be in order.

The use of tax instruments to promote a greater equality in the distribution of income would tend to be reinforced by the repercussions on dividend income. An increase in individual income tax rates or progressivity would have a leveling effect on the distribution of net income. In addition, the reduction of dividend payments would tend to fall disproportionately on high income groups. This might be partially offset, however, to the extent that any resulting increase in corporate saving is translated into lightly taxed capital gains for upper income groups.

The anticyclical objectives of tax and interest rate measures might have mixed results on corporate saving and dividends. If lower interest rates or lower individual taxes are used to combat recessions, the increase in the dividend payout ratio would probably reinforce the primary policies. Even though corporate saving would be reduced in favor of dividends, in a recession it seems likely that retentions would not be fully invested. In this case, the positive impact on aggregate demand of the increase in dividends would probably exceed the negative effect of the reduction of corporate saving. If higher interest rates and taxes were used for anti-inflationary purposes, they would also tend to reduce dividends. Unlike the converse case, the effect on aggregate demand in a buoyant economy is likely to be offset by additional investment of the increased corporate saving. Higher corporate taxes and lower depreciation allowances would tend to depress both dividends and corporate saving, however.

If influencing corporate policy is a major objective, broad fiscal instruments may be inappropriate. It is possible to influence the dividend-saving decision directly, if necessary. The British, for example, at one time provided "nondistribution relief" in corporate taxation to encourage profit retention. During the 1930's, the United States imposed a surtax on undistributed profits to discourage corporate saving. Similar measures could be used to offset or reinforce the effects of the broader fiscal instruments on corporate dividend-saving policy.